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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/578,578	05/05/2006	Andre Sloth Eriksen	10494.0002-00000	3450

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EXAMINER	
WALBERG, TERESA J	

ART UNIT	PAPER NUMBER
3744	

MAIL DATE	DELIVERY MODE
04/13/2010	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/578,578	ERIKSEN, ANDRE SLOTH	
	Examiner	Art Unit	
	Teresa J. Walberg	3744	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 August 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *70-89,95 and 103-112* is/are pending in the application.

4a) Of the above claim(s) *89 and 95* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *70-88,1-3-112* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *18 December 2008* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 103, 104, 106, and 107 are rejected under 35 U.S.C. 103(a) as being unpatentable over Batchelder (6,019,165) in view of Chu et al (2003/0056939) and Batchelder (6,021,844) and further in view of Chou et al (2006/0169440), and Athari (2004/0141275).

Batchelder ('165) discloses a cooling system for a computer system processing unit as claimed including an integrated element (Fig. 2), a heat radiator (20, 28), and a fan (34), the integrated element including a heat exchanging interface (at 52), a reservoir (at rotor 54), and a pump (at 56), the reservoir being adapted to receive a cooling liquid from an inlet and pass the cooling liquid to an outlet (Fig. 2), the reservoir including a plurality of channels to direct flow of cooling liquid across the heat exchanging surface, the heat radiator (at 28) being connected between the outlet and the inlet and being adapted to exhaust heat from the cooling liquid, the heat exchanging interface being adapted to provide thermal contact between the processing unit and the cooling liquid (Fig. 2), such that heat is dissipated from the processing unit to the cooling liquid as the cooling liquid passes across the heat exchanging interface, and the pump

(56) being adapted to pump cooling liquid through the reservoir and the heat radiator, the pump comprising an impeller (56) magnetically connected with a pump rotor (54), the impeller (54) being submerged in the cooling liquid and being adapted to communicate the cooling liquid into the plurality of channels (Fig. 2), the impeller disposed in a recess sized in relation to a diameter of the impeller (54) and including a recess inlet and outlet (Fig. 2), the impeller adapted to pass the cooling liquid from the recess inlet, through the recess outlet and into the plurality of channels (Fig. 2), the plurality of channels being integral to the inner surface of the heat exchanging interface (52), the inlet, outlet and pump being disposed proximate the heat exchanging interface and being structurally adapted to generate a turbulent flow of cooling liquid across the heat exchanging interface (Fig. 2), the driving means being further adapted to drive a fan (34) associated with the reservoir and/or the heat radiator, the fan (34) being configured to direct air through the heat radiator (see flow arrows in Fig. 2).

Batchelder ('165) does not disclose the fan being driven by a motor separate from the AC motor of the pump or the fluid being pumped to a separate location to be dissipated. However, Batchelder ('165) states that it is known in the art to pump the fluid to a different location for dissipation of the heat (col. 1, lines 44-48) and to use separate motors to drive the fan and the pump (col. 1, line 61-col. 2, line 1). It would have been obvious to one of ordinary skill in the art to use separate motors to drive the fan and

the pump in the cooling system of Batchelder ('165), the motivation being to increase reliability of the device since failure of one motor would not cause both the fan and the pump to stop and to pump the fluid to a different location for dissipation of the heat, the motivation being to prevent heat buildup adjacent the equipment that is to be cooled.

Batchelder ('165) does not show an AC motor, the impeller having curved blades, the AC voltage to operate the motor being obtained by converting a DC voltage, the impeller being mechanically integrated with the pump rotor, with the pump being disposed within the reservoir.

Chu et al disclose a cooling system for a computer system (para. 0010) including an impeller (26) mechanically integrated with a pump rotor (16), with the pump being disposed within the reservoir (Fig. 1).

Batchelder ('844) teaches that it is known in the art to use magnetically coupled motors and impellers (Fig. 2) and mechanically coupled motors and impellers (Fig. 7) and further teaches that one of ordinary skill in the art would be motivated to use a mechanically coupled motor and impeller with a hermetically sealed cavity for applications requiring high reliability (col. 8, lines 43-55).

It would have been obvious to one of ordinary skill in the art to substitute a mechanically integrated impeller and pump rotor with the pump within the reservoir for the magnetically connected impeller and pump rotor with pump disposed outside of the reservoir of Batchelder ('165), in view of the teaching of Batchelder ('844) that it is advantageous

to use a mechanically coupled motor and impeller for improved reliability and because the substitution of one known element for another would have yielded predictable results to one of ordinary skill in the art at the time of the invention (KSR International Co. v. Teleflex Inc., 82 USPQ2d 1385 (2007).

Chou et al disclose a cooling system for a computer system (para. 0005) including an impeller (603) mechanically integrated with a pump rotor (Fig. 5), the impeller having a plurality of curved blades (para. 0040, last sentence) and teaches that AC or DC motors can be used in such devices (see paragraphs 0041 and 0045 and claims 18-20).

It would have been obvious to one of ordinary skill in the art in view of Chou et al to use an impeller with curved blades and an AC motor with the cooling system of Batchelder ('165), since Chou et al teaches that such impeller blade types and motor types are interchangeable and because the substitution of one known element for another would have yielded predictable results to one of ordinary skill in the art at the time of the invention (KSR International Co. v. Teleflex Inc., 82 USPQ2d 1385 (2007).

Athari discloses using a DC power supply such as is found in a laptop computer (para. 0003) to power an AC motor (para. 0013, last sentence), the AC voltage to operate the motor being obtained by converting a DC voltage (para. 0013, last sentence).

It would have been obvious in view of Athari to use an AC motor and a voltage converter with the cooling device Batchelder in view of Chu et al and Batchelder and Chou et al, the motivation being to enable operating the cooling system from the DC power supply of the computer.

3. Claims 70-84, 87, 105, and 108-112 are rejected under 35 U.S.C. 103(a) as being unpatentable over Batchelder (6,019,165) in view of Chu et al (2003/0056939) and Batchelder (6,021,844) and further in view of Chou et al (2006/0169440), Athari (2004/0141275), and Alvaro (6,114,827).

Batchelder discloses a cooling system for a computer system processing unit as claimed including an integrated element and a heat radiator (Fig. 2), the integrated element including a heat exchanging interface (at 52), a reservoir (at rotor 54), and a pump (at 56), the reservoir being adapted to receive a cooling liquid from an inlet and pass the cooling liquid to an outlet (Fig. 2), the reservoir including a plurality of channels to direct flow of cooling liquid across the heat exchanging surface , the heat radiator (at 28) being connected between the outlet and the inlet and being adapted to exhaust heat from the cooling liquid, the heat exchanging interface being adapted to provide thermal contact between the processing unit and the cooling liquid (Fig. 2), such that heat is dissipated from the processing unit to the cooling liquid as the cooling liquid passes across the heat exchanging interface, and the pump (56) being adapted to pump cooling liquid through the reservoir and the heat

radiator, the pump comprising an impeller (56) magnetically connected with a pump rotor (54), the impeller (54) being submerged in the cooling liquid and being adapted to communicate the cooling liquid into the plurality of channels (Fig. 2), the impeller disposed in a recess sized in relation to a diameter of the impeller (54) and including a recess inlet and outlet (Fig. 2), the impeller adapted to pass the cooling liquid from the recess inlet, through the recess outlet and into the plurality of channels (Fig. 2), the plurality of channels being integral to the inner surface of the heat exchanging interface (52), the inlet, outlet and pump being disposed proximate the heat exchanging interface and being structurally adapted to generate a turbulent flow of cooling liquid across the heat exchanging interface (Fig. 2), the driving means being further adapted to drive a fan (34) associated with the reservoir and/or the heat radiator.

Batchelder ('165) does not disclose the fan being driven by a motor separate from the AC motor of the pump or the fluid being pumped to a separate location to be dissipated. However, Batchelder ('165) states that it is known in the art to pump the fluid to a different location for dissipation of the heat (col. 1, lines 44-48) and to use separate motors to drive the fan and the pump (col. 1, line 61-col. 2, line 1). It would have been obvious to one of ordinary skill in the art to use separate motors to drive the fan and the pump in the cooling system of Batchelder ('165), the motivation being to increase reliability of the device since failure of one motor would not cause both the fan and the pump to stop and to pump the fluid to a

different location for dissipation of the heat, the motivation being to prevent heat buildup adjacent the equipment that is to be cooled.

Batchelder does not show an AC motor, the impeller having curved blades, the AC voltage to operate the motor being obtained by converting a DC voltage, the impeller being mechanically integrated with the pump rotor, with the pump being disposed within the reservoir and the power characteristics being selected to cause the motor to rotate the impeller in a predetermined rotational direction.

Chu et al disclose a cooling system for a computer system (para. 0010) including an impeller (26) mechanically integrated with a pump rotor (16), with the pump being disposed within the reservoir (Fig. 1).

Batchelder ('844) teaches that it is known in the art to use magnetically coupled motors and impellers (Fig. 2) and mechanically coupled motors and impellers (Fig. 7) and further teaches that one of ordinary skill in the art would be motivated to use a mechanically coupled motor and impeller with a hermetically sealed cavity for applications requiring high reliability (col. 8, lines 43-55).

It would have been obvious to one of ordinary skill in the art to substitute a mechanically integrated impeller and pump rotor with the pump within the reservoir for the magnetically connected impeller and pump rotor with pump disposed outside of the reservoir of Batchelder ('165), in view of the teaching of Batchelder ('844) that it is advantageous to use a mechanically coupled motor and impeller for improved reliability

and because the substitution of one known element for another would have yielded predictable results to one of ordinary skill in the art at the time of the invention (KSR International Co. v. Teleflex Inc., 82 USPQ2d 1385 (2007).

Chou et al disclose a cooling system for a computer system (para. 0005) including an impeller (603) mechanically integrated with a pump rotor (Fig. 5), the impeller having a plurality of curved blades (para. 0040, last sentence) and teaches that AC or DC motors can be used in such devices (see paragraphs 0041 and 0045 and claims 18-20).

It would have been obvious to one of ordinary skill in the art in view of Chou et al to use an impeller with curved blades and an AC motor with the cooling system of Batchelder, since Chou et al teaches that such impeller blade types and motor types are interchangeable and because the substitution of one known element for another would have yielded predictable results to one of ordinary skill in the art at the time of the invention (KSR International Co. v. Teleflex Inc., 82 USPQ2d 1385 (2007).

Athari discloses using a DC power supply such as is found in a laptop computer (para. 0003) to power an AC motor (para. 0013, last sentence), the AC voltage to operate the motor being obtained by converting a DC voltage (para. 0013, last sentence).

It would have been obvious in view of Athari to use an AC motor and a voltage converter with the cooling device Batchelder in view of Chu

et al and Chou et al, the motivation being to enable operating the cooling system from the DC power supply of the computer.

Batchelder in view of Chu et al, Chou et al, and Athari do not disclose means to detect an angular position of the pump rotor to rotate the rotor in a desired direction . Alvaro discloses means to detect an angular position of a rotor (see abstract) and to enable rotating the rotor in a desired direction (see col. 1, lines 34-36). It would have been obvious in view of Alvaro to provide means to detect an angular position of the pump rotor rotate the rotor in the desired direction in the cooling system of Batchelder in view of Chu et al, Chou et al, and Athari the motivation being to prevent damage to the motor as taught by Alvaro.

4. Claims 85, 86, and 88 are rejected under 35 U.S.C. 103(a) as being unpatentable over Batchelder (6,019,165) in view of Chu et al (2003/0056939), Batchelder (6,021,844), Chou et al (2006/0169440), Athari (2004/0141275), and Alvaro (6,114,827) and further in view of Bingler (6,668,911).

Batchelder in view of Chu et al, Chou et al, Athari, and Alvaro disclose a cooling system having the claimed structure with the exception of the interface comprising a surface of the processing unit disposed in direct contact with the cooling liquid, or an element adapted to be separable from the reservoir.

Bingler discloses an interface comprising a surface of a heat source (1) disposed in direct contact with the cooling liquid (Fig. 3), and an

element (the heat source 1) adapted to be separable from the reservoir. See Fig. 3.

It would have been obvious to one of ordinary skill in the art in view of Bingler to provide the processing unit of Batchelder in view of Chu et al and Alvaro in direct contact with the liquid in the reservoir, the motivation being increase the amount of heat that could be removed.

5. Applicant's arguments filed 13 August 2009 have been fully considered but they are not persuasive.

Applicant argues that the applied references do not disclose the fan being driven by a motor separate from the AC motor of the pump or the fluid being pumped to a separate location to be dissipated. However, Batchelder ('165) states that it is known in the art to pump the fluid to a different location for dissipation of the heat (col. 1, lines 44-48) and to use separate motors to drive the fan and the pump (col. 1, line 61-col. 2, line 1). It would have been obvious to one of ordinary skill in the art to use separate motors to drive the fan and the pump in the cooling system of Batchelder ('165), the motivation being to increase reliability of the device since failure of one motor would not cause both the fan and the pump to stop and to pump the fluid to a different location for dissipation of the heat, the motivation being to prevent heat buildup adjacent the equipment that is to be cooled.

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Teresa J. Walberg whose telephone number is 571-272-4790. The examiner can normally be reached on M-F 8:00 - 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cheryl Tyler can be reached on 571-272-4834. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Teresa J. Walberg/
Primary Examiner, Art Unit 3744

/TW/